



Basic Course Information

Semester:	Fall 2023	Instructor Name:	Octavio Ortiz
Course Title & #:	CS 281	Email:	octavio.ortiz@imperial.edu
CRN #:	10522	Webpage (optional):	Canvas Course
Classroom:	3109	Office #:	2767.1
Class Dates:	8/14 – 12/9	Office Hours:	Faculty Schedule
Class Days:	T/R	Office Phone #:	760-355-5706
Class Times:	11:30 – 2:10 PM	Emergency Contact:	Silvia Murray
Units:	3	Class Format:	In-Person

Course Description

Basics of machine architecture, machine language, assembly language and operating systems. Representations of data types and structures along with instruction representation and execution, addressing modes, subroutine calls and return mechanisms, fixed point systems, and basic organization of the von Neumann machine are included. (C-ID COMP 142) (CSU/UC)

Course Prerequisite(s) and/or Corequisite(s)

CS 220 or CS 221 and MATH 091 or MATH 098 with a grade of C or better, or appropriate placement as defined by AB 705.

Student Learning Outcomes

Upon course completion, the successful student will have acquired new skills, knowledge, and or attitudes as demonstrated by being able to:

1. Describe how data is represented in computer memory.
2. Show how fundamental high-level programming constructs are implemented at the machine-language level.
3. Write simple assembly language program segments.

Course Objectives

Upon satisfactory completion of the course, students will be able to:

1. Describe how data are represented in the computer, including floating point numbers and arrays.
2. Code, execute and debug assembly language programs.
3. Demonstrate an understanding of computer architecture.
4. Demonstrate the function of CPU registers.
5. Use correct addressing modes and terminology.
6. Use integer arithmetic instructions.
7. Correctly use repetition constructs, macros and procedures in assembly language.
8. Program keyboard input and text screen output.
9. Use machine instructions involving data structure stacks to code selected algorithms.

Textbooks & Other Resources or Links

Assembly Language for x86 Processors

Author: Kip Irvine
 Edition: 8th
 ISBN: 978-0-13-538165-6
 Copyright Year: 2020
 Publisher: Pearson

Course Requirements and Instructional Methods

Students will be exposed to various instructional methods. Lectures, both in person and through pre-recorded tutorial videos, will introduce students to fundamental programming concepts. Students will then apply what they learn in lectures to their own programming assignments and applications.

There will be weekly programming assignments where students will reflect on their learning and engage in previous, current and new programming topics. A comprehensive semester final exam or project will assess students' ability to read, debug and rationalize code segments that range in complexity.

Course Grading Based on Course Objectives

ASSIGNMENT	POINTS
Programming Exercises	15%
Approximately 10-15	
Exams	60%
Three planned exams	
Projects/Final Exam	25%
Midterm/Final project & comprehensive final	
Total	100%

Score	Letter Grade
≥ 90%	A
≥ 80%	B
≥ 70%	C
≥ 60%	D
< 60%	F

Course Policies

Attendance:

Attendance is mandatory. Students are expected to attend every class meeting. Lectures will preview programming assignments, programming applications and future assessments.

- Although attendance is not explicitly factored into your grade, failing to complete programming assignments and assessments due to absences will negatively impact your grade.
- Students with excessive absences will be dropped from the course as outlined in AP 5075.

Late Submissions:

Programming assignments are to be completed and submitted by the due date stated on Canvas. Late programming assignments will be accepted and penalized as follows:

- 90% maximum score if submitted within 24 hours past due date
- 80% maximum score if submitted within 48 hours past due date
- 70% maximum score if submitted within 72 hours past due date
- 50% maximum score if more than three days and less than a week past due date
- No credit will be given to assignments that submitted past the hard deadline (see calendar)

Programming applications/projects, quizzes and the final exam will NOT be accepted late.

Make-up Assignments:

There are no make-up assignments.

- Programming applications/projects and quizzes cannot be made up, however, if the material is presented again in future applications or quizzes, then the failed assessment will be reevaluated.

Drop Policy

The instructor reserves the right to drop students who fail to attend the first-class session or fail to complete the first assignment by the assigned due date.

Other Course Information

Resources:

<https://asmirvine.com/> - Publisher resources

IVC Student Resources

IVC wants you to be successful in all aspects of your education. For help, resources, services, and an explanation of policies, visit <http://www.imperial.edu/studentresources> or click the heart icon in Canvas.

Anticipated Class Schedule/Calendar

The semester calendar is meant to provide an overview of the topics that will be covered throughout the semester. Every effort will be made to adhere to the calendar; however, changes might be necessary.

Week	Date	Topic	Assignment
Week 1	8/15	<ul style="list-style-type: none"> • Syllabus & Course Policies <ul style="list-style-type: none"> ○ Modules, collaborative notes, programming assignments, etc... 	
	8/17	<ul style="list-style-type: none"> • Basic Concepts <ul style="list-style-type: none"> ○ Data representation (Binary, hex, addition, subtraction) 	
Week 2	8/22	<ul style="list-style-type: none"> • Basic Concepts <ul style="list-style-type: none"> ○ Data Types 	
	8/24	<ul style="list-style-type: none"> • x86 Processor Architecture <ul style="list-style-type: none"> ○ Components of a typical x86 Computer ○ 32-BIT x86 Processors 	
Week 3	8/29	<ul style="list-style-type: none"> • Assembly Language Fundamentals <ul style="list-style-type: none"> ○ First assembly language program ○ Adding & subtracting Integers 	
	8/31	<ul style="list-style-type: none"> • Assembly Language Fundamentals <ul style="list-style-type: none"> ○ Defining data ○ Symbolic constants 	
Week 4	9/5	<ul style="list-style-type: none"> • Assembly Language Fundamentals <ul style="list-style-type: none"> ○ Determining appropriate data types 	
	9/7	<ul style="list-style-type: none"> • Assembly Language Fundamentals <ul style="list-style-type: none"> ○ Determining appropriate data types 	
Week 5	9/12	<ul style="list-style-type: none"> • Exam 1 (Chapters 1-3) <ul style="list-style-type: none"> ○ Deadline to submit late assignments (Ch.1-4) for 50% credit. • Data Transfers, Addressing & Arithmetic <ul style="list-style-type: none"> ○ Data transfer instructions 	
	9/14	<ul style="list-style-type: none"> • Data Transfers, Addressing & Arithmetic <ul style="list-style-type: none"> ○ Addition & Subtraction ○ Data-related operators & directives 	
Week 6	9/19	<ul style="list-style-type: none"> • Data Transfers, Addressing & Arithmetic <ul style="list-style-type: none"> ○ JMP & LOOP Instructions 	
	9/21	<ul style="list-style-type: none"> • Data Transfers, Addressing & Arithmetic <ul style="list-style-type: none"> ○ Arrays 	
Week 7	9/26	<ul style="list-style-type: none"> • Procedures <ul style="list-style-type: none"> ○ Stack Operations ○ Defining and Using Procedures 	
	9/28	<ul style="list-style-type: none"> • Procedures <ul style="list-style-type: none"> ○ Linking to an External Library ○ Irvine32 Library 	
Week 8	10/3	Midterm Project	

Week	Date	Topic	Assignment
	10/5		
Week 9	10/10	<ul style="list-style-type: none"> • Exam 2 (Chapters 4-5) <ul style="list-style-type: none"> ○ Deadline to submit late assignments (Ch.4-5) for 50% credit. • Conditional Processing <ul style="list-style-type: none"> ○ Boolean & Comparison Instructions ○ Conditional Jumps 	
	10/12	<ul style="list-style-type: none"> • Conditional Processing <ul style="list-style-type: none"> ○ Conditional Loop Instructions ○ Conditional Structures 	
Week 10	10/17	<ul style="list-style-type: none"> • Integer Arithmetic <ul style="list-style-type: none"> ○ Shift & Rotate Instructions ○ Shift & Rotate Applications 	
	10/19	<ul style="list-style-type: none"> • Integer Arithmetic <ul style="list-style-type: none"> ○ Multiplication & Division Instructions ○ Extended Addition & Substraction ○ ASCII and Unpacked Decimal Arithmetic 	
Week 11	10/24	<ul style="list-style-type: none"> • Advanced Procedures <ul style="list-style-type: none"> ○ Stack Frames ○ Recursion 	
	10/26	<ul style="list-style-type: none"> • Advanced Procedures <ul style="list-style-type: none"> ○ INVOKE, ADDR, PROC, and PROTO ○ Creating Multimode Programs 	
Week 12	10/31	<ul style="list-style-type: none"> • Strings & Arrays <ul style="list-style-type: none"> ○ String Primitive Instructions ○ Selected String Procedures 	
	11/2	<ul style="list-style-type: none"> • Strings & Arrays <ul style="list-style-type: none"> ○ Two-Dimensional Arrays ○ Searching & Sorting Integer Arrays 	
Week 13	11/7	<ul style="list-style-type: none"> • Exam 3 (Chapters 6-9) <ul style="list-style-type: none"> ○ Deadline to submit late assignments (Ch.4-5) for 50% credit. • Structures & Macros <ul style="list-style-type: none"> ○ Structures ○ Macros 	
	11/9	<ul style="list-style-type: none"> • Structures & Macros <ul style="list-style-type: none"> ○ Conditional-Assembly Directive ○ Defining Repeat Blocks 	
Week 14	11/14	<ul style="list-style-type: none"> • MS-Windows Programming <ul style="list-style-type: none"> ○ Win32 Console Programming 	
	11/16	<ul style="list-style-type: none"> • MS-Windows Programming <ul style="list-style-type: none"> ○ Writing a Graphical Windows Application 	
THANKSGIVING BREAK			
Week 15	11/28	<ul style="list-style-type: none"> • MS-Windows Programming 	



Week	Date	Topic	Assignment
	11/30	<ul style="list-style-type: none"> MS-Windows Programming Final Project 	
Week 16	12/5	<ul style="list-style-type: none"> Final Project 	
	12/7	<ul style="list-style-type: none"> Final Project Due Comprehensive Final Exam 	

Subject to change without prior notice

OCTAVIO ORTIZ
IVC Instructor's Schedule of Classes and Office Hours
Science, Math and Engineering Department
Fall 2023

	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1PM	2:00 PM	3:00 PM	4:00 PM	
M	COURSE	CS 221			ENGR 100			Office Hour Online - Zoom 1:30 - 2:30 PM			
	CRN	LEC/LAB 10521			LEC/LAB 10929						
	LEC/LAB	7:30 - 10:00 AM			10:15 - 12:45 PM						
	FACULTY	RM #2724			RM #3119						
T	COURSE		Office Hour In-Person 8:30 - 9:30 AM RM #2767	ENGR 210		CS 281			CS 221 - Hybrid		
	CRN			LEC 10603		LEC/LAB 10522			Lab/Lec 10962		
	LEC/LAB			9:40 - 11:05 AM		11:30 - 2:10 PM			2:40 - 4:05 PM		
	FACULTY			RM #2721		RM #3109			Online - RM #3109		
W	COURSE	CS 221			ENGR 100			Office Hour Online - Zoom 1:30 - 2:30 PM			
	CRN	LEC/LAB 10521			LEC/LAB 10929						
	LEC/LAB	7:30 - 10:00 AM			10:15 - 12:45 PM						
	FACULTY	RM #2724			RM #3119						
R	COURSE		Office Hour In-Person 8:30 - 9:30 AM RM #2767	ENGR 210		CS 281			CS 221 - Hybrid		
	CRN			LEC 10603		LEC/LAB 10522			Lab/Lec 10962		
	LEC/LAB			9:40 - 11:05 AM		11:30 - 2:10 PM			2:40 - 4:05 PM		
	FACULTY			RM #2721		RM #3109			Online - RM #3109		
F	COURSE										
	CRN										
	LEC/LAB										
	FACULTY										

Course No	Sections	Lec Hrs	Lab Hrs
CS 221	2	4	6
CS 281	1	2	3
ENGR 100	1	2	3
ENGR 210	1	3	0
Total		11	12

Instructor's Name	Octavio Ortiz
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